

MILITARY NEEDS AND FORECAST II

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U.S. Air Force

OBJECTIVE

- PRODUCE A LIST OF MAJOR WAR-FIGHTING/WAR-SUPPORTING CAPABILITIES THAT COULD BE REALIZED BY:
 - EXPLOITING EMERGING/ANTICIPATED TECHNOLOGIES
 - INCORPORATING THE TECHNOLOGIES INTO INNOVATIVE SYSTEMS CONCEPTS
- SUBMIT TO AIR FORCE CORPORATE REVIEW FOR SELECTION OF CAPABILITIES FOR FURTHER DEVELOPMENT

TASKING

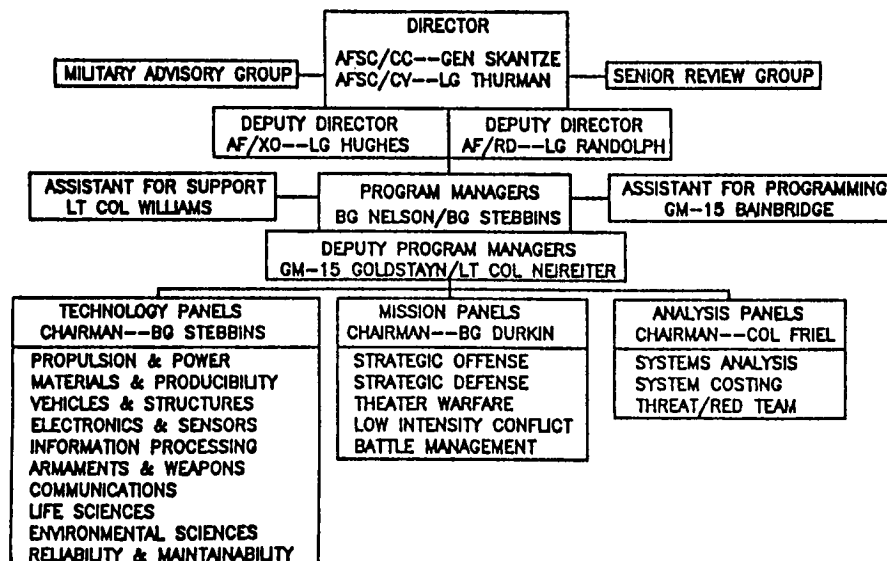
12 JUN 85 LETTER FROM SECRETARY ORR AND
GENERAL GABRIEL

"ONE OF THIS NATION'S FUNDAMENTAL STRENGTHS IS ITS ABILITY TO TURN TECHNOLOGICAL OPPORTUNITIES INTO SUPERIOR WEAPONS SYSTEMS ..."

"WE NEED TO BREAK AWAY FROM CONVENTIONAL THINKING, LOOK AT WHAT IS TECHNOLOGICALLY POSSIBLE ..."

PROJECT FORECAST II

- o SPONSORED BY SAF & CSAF
- o 10-20 YEAR TECHNOLOGY PUSHES
- o IN-HOUSE AF, ASSISTED BY INDUSTRY & ACADEMIA
- o SEEKING BROAD CONSENSUS
- o PRESENTED TO CORPORATE AF LEADERSHIP
- o 175 AIR FORCE MILITARY AND CIVILIAN PERSONNEL
-HAND-PICKED FROM MAJCOMS AND LABS
- o SPENT 6 MONTHS CREATING 2,000 IDEAS
-EXPOSED THE BEST IDEAS TO SOME OF THE FINEST
MINDS IN THE COUNTRY
- o SELECTED 70 TECHNOLOGIES AND SYSTEMS INITIATIVES



MILITARY ADVISORY GROUP

- VICE COMMANDERS OF: AFLC, ATC, MAC
PACAF, SAC, SPACECMD, TAC, USAFE
- COMMANDERS OF: AAC, AFCC, AU, DIA,
ESC, NMC
- HQ USAF: DCS/LE, DCS/PR, AF/IN, AF/SA
- OJCS: VDJS

PROCESS

SENIOR REVIEW GROUP

GEN LEW ALLEN, Jr, USAF(Ret)
GEN WILLIAM W. MOMYER, USAF(Ret)
DR SOLOMON BUCHSBAUM, Exec VP, Bell Labs
DR EUGENE COVERT, Chmn, AFSAB
MR JULIAN DAVIDSON, VP, Chmn, AFSB
GEN RUSSELL E. DOUGHERTY, USAF(Ret)
MR CHARLES A. FOWLER, Chmn, DSB
LT GEN GLENN A. KENT, USAF(Ret)
ADM ISSAC C. KIDD, Jr, USN(Ret)
MR WALTER E. MORROW, Jr, Dir, MIT Lincoln Lab
DR EBERHARDT RECHTIN, Pres, Aerospace Corp
GEN FELIX M. ROGERS, USAF(Ret)
GEN BERNARD A. SCHRIEVER, USAF(Ret)
LT GEN BRENT SCOWCROFT, USAF(Ret)
DR HAROLD W. SORENSON, Chief Scientist, USAF
GEN DONN A. STARRY, USA(Ret)
DR JAMES THOMSON, VP, RAND Corp
MAJ GEN JASPER A. WELCH, Jr, USAF(Ret)

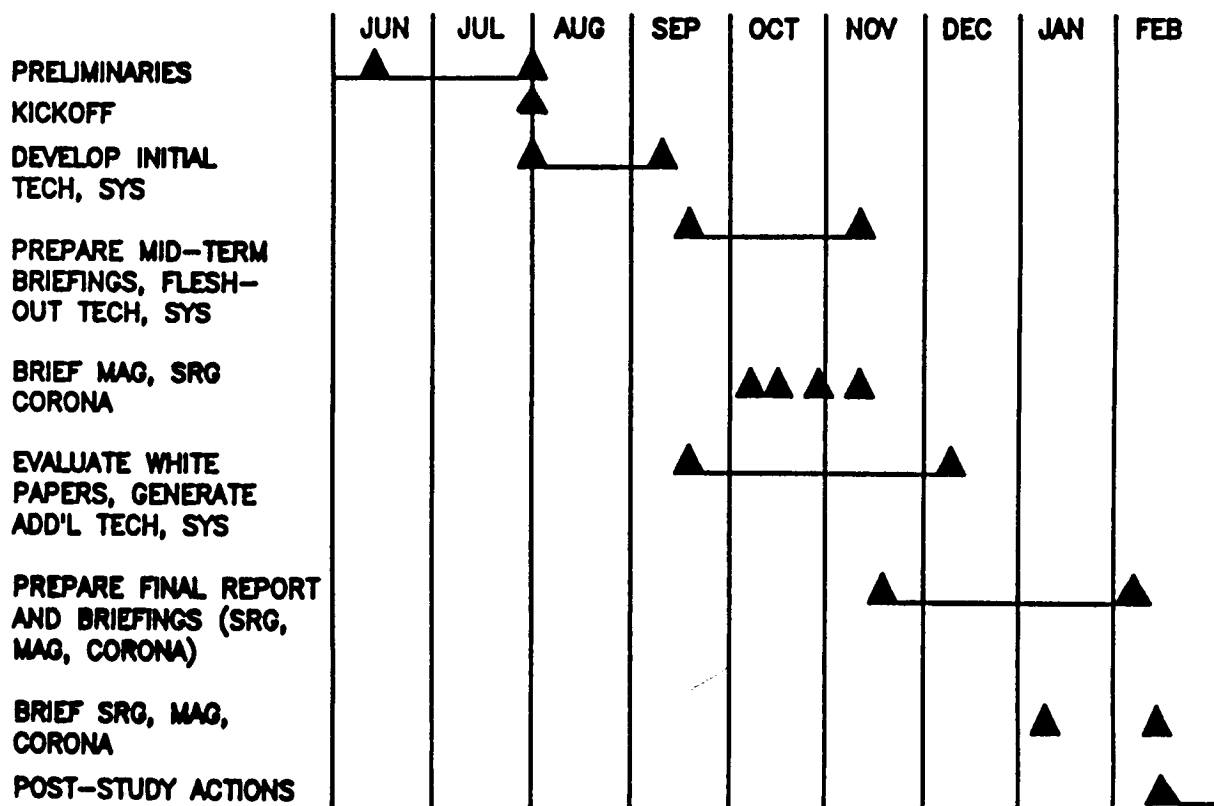
PANEL TASKS

- **TECHNOLOGY PANEL GROUP**
 ASSESS TECHNOLOGY BASE, TRENDS, RISKS
 IDENTIFY EMERGING TECHNOLOGIES

- **MISSION PANEL GROUP**
 IDENTIFY CAPABILITIES NEEDED BY USING COMMANDS
 EVALUATE UTILITY OF TECHNOLOGIES AND SYSTEMS IDENTIFIED

- **ANALYSIS PANEL GROUP**
 ASSESS THE THREAT AND PERFORM "RED TEAMING"
 ANALYZE SYSTEMS IDENTIFIED (COMPARE AGAINST ALTERNATIVES)
 DEVELOP AND MONITOR THE STUDY PROCESS

SCHEDULE



HYPERVELOCITY VEHICLES

DESCRIPTION

**HYPERSONIC VEHICLES FOR SUB-ORBITAL
AND EARTH-TO-ORBIT AND RETURN OPS**

PAYOFFS

- ROUTINE, AFFORDABLE SPACE OPS
- ICBM RESPONSE TIME WITH MANNED AIRCRAFT FLEXIBILITY
- QUICK-REACTION SURVEILLANCE

BOOST GLIDE VEHICLE

DESCRIPTION

**TRANSATMOSPHERIC VEHICLE BOOSTED TO HYPERSONIC
VELOCITIES CAPABLE OF MANEUVERING IN FLIGHT**

PAYOFFS

- RAPID REACTION CAPABILITY WITH SYSTEM
FREED FROM BALLISTIC CONSTRAINTS
- MANEUVERABILITY TO EXPAND OPERATIONAL ENVELOPE
- MATERIAL CONSTRUCTION TO WITHSTAND HIGH TEMPERATURE
AND STRUCTURAL LOADING

MANNED SPACE STATION

DESCRIPTION

CONTINUOUSLY MANNED, MODULARLY CONSTRUCTED, MULTIPURPOSE SPACE FACILITY FOR MAINTENANCE, STORAGE, DOCKING, AND REPAIR OF SPACE ASSETS. FACILITY WILL BE IN A SURVEILLANCE SATELLITE-TYPE ORBIT POWERED BY SOLAR CELL GENERATOR OR NUCLEAR SOURCE.

PAYOFFS

MAIN OPERATING BASE FOR SPACE SORTIES
SATELLITE OR OTHER SPACE VEHICLE REPAIR FACILITY
DATA PROCESSING SITE FOR SURVEILLANCE SATELLITES
ALTERNATE COMMAND POST

ADVANCED HEAVY LIFT SPACE VEHICLE

DESCRIPTION

A REUSABLE LAUNCH VEHICLE WHICH TRANSPORTS PAYLOADS RANGING FROM 150,000 TO 300,000 POUNDS FROM EARTH TO ORBIT

PAYOFFS

MORE FLEXIBILITY IN SPACE TRANSPORTATION
TEN FOLD DECREASE IN CURRENT COST PER POUND
TO ORBIT PAYLOADS
ENABLES SPACE-BASED BATTLE MANAGEMENT

CHEMICALLY-BOUND, EXCITED STATE MATERIALS

DESCRIPTION

NEW FAMILY OF HIGHLY ENERGETIC MATERIALS
THAT PROMISES RADICALLY INCREASED
PROPULSIVE/EXPLOSIVE CAPABILITIES

ENABLED BY:

NEW THEORIES -- SUPER COMPUTER MODELING
NEW DATA -- LASER DIAGNOSTICS

PAYOFFS

POTENTIAL REVOLUTION IN AEROSPACE PROPULSION
AT LEAST 10X REDUCTION IN COST TO ORBIT
AT LEAST 10X INCREASE IN AIRCRAFT CAPABILITY
(RANGE, ETC.)

ALL-ASPECT LAUNCH FOR ROCKETS

COMPACT HYPERSONIC VELOCITY VEHICLES --
ROUTINE OPERATIONS FROM CONVENTIONAL
RUNWAYS

NEW HIGH EXPLOSIVES

NEW ENERGY SOURCES

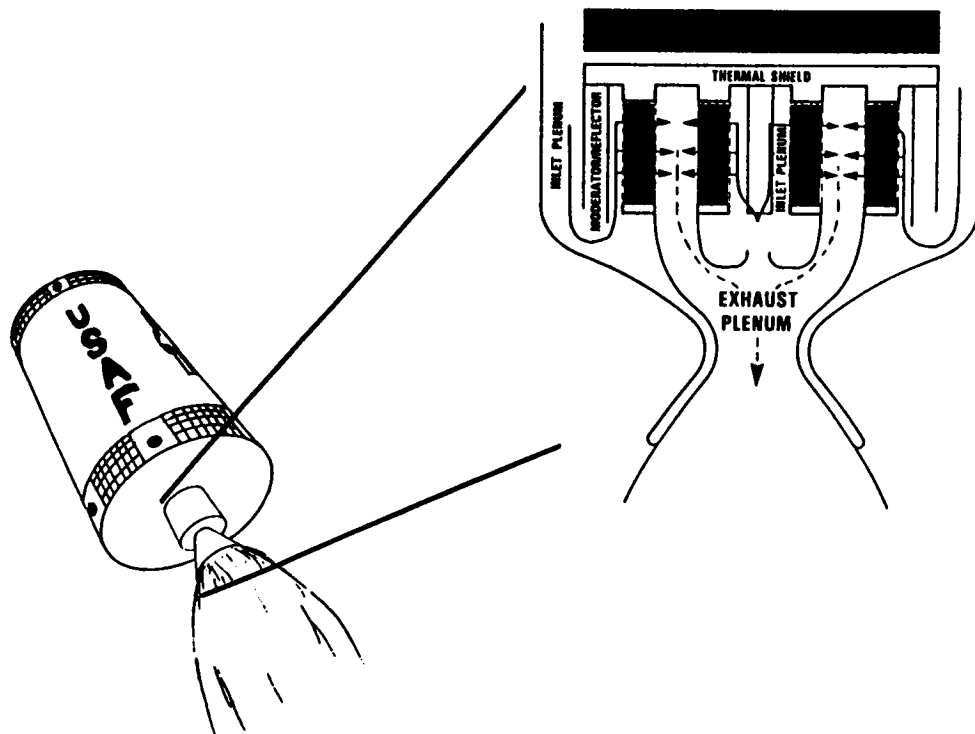
SAFE, COMPACT, NUCLEAR PROPULSION IN SPACE

DESCRIPTION

FRESH APPROACH -- HYDROGEN PROPELLANT
HEATED BY HOT, CERAMIC-CONFINED,
NUCLEAR FUEL PELLETS

PAYOFFS

- MULTIPLE OTV OPERATIONS FOR GIVEN FUEL LOAD
- VERY SIMPLE OPERATION -- LOW RECURRING COSTS
- OIL-BARREL SIZE -- 50,000 LBS THRUST
- SAFE -- INERT UNTIL READY FOR OPERATION
IN SPACE. CLEAN DISPOSAL AFTER DEPLETION
- CLEAN EXHAUST -- NO NUCLEAR PRODUCTS



ANTI-PROTON TECHNOLOGY

DESCRIPTION

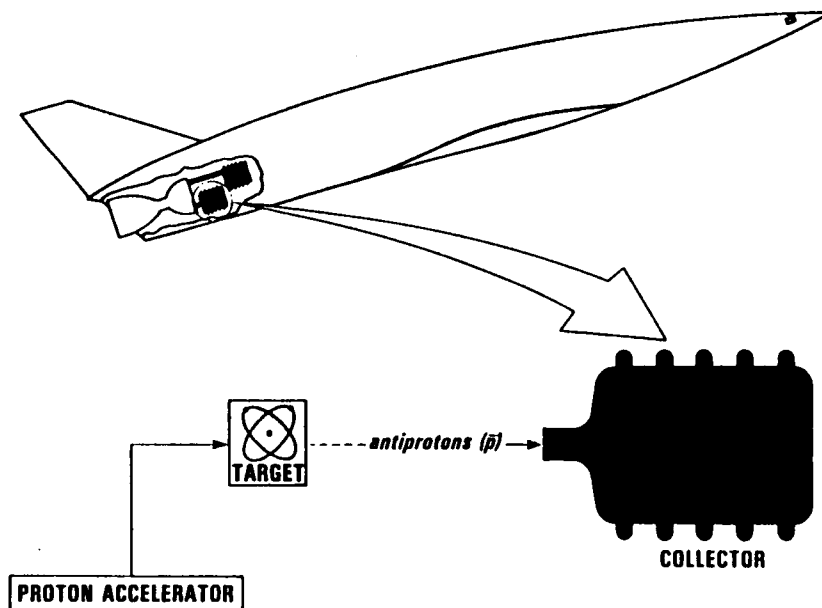
JOIN PROTONS & ANTI-PROTONS TO CREATE
ENORMOUS ENERGY SOURCES

PAYOFF

FUEL WEIGHT ALMOST NIL FOR MULTIPLE
OPS IN SPACE

GREAT MILITARY POTENTIAL

BREAKTHROUGH IN SPACE TRAVEL



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DISTRIBUTED SPARSE ARRAY OF SPACECRAFT

DESCRIPTION

SPARSE PHASED ARRAY IN SPACE FOR RADAR, COMM, & SIGINT
USING UNCONNECTED, IDENTICAL ELEMENTS SPREAD OVER A
LARGE AREA

PAYOFFS

- SURVIVABLE CONSTELLATION WITH NO CRITICAL NODES
- GROWTH POTENTIAL WITH PERFORMANCE/COST TRADEOFFS
- LOWER TOTAL SYSTEM COST POTENTIAL

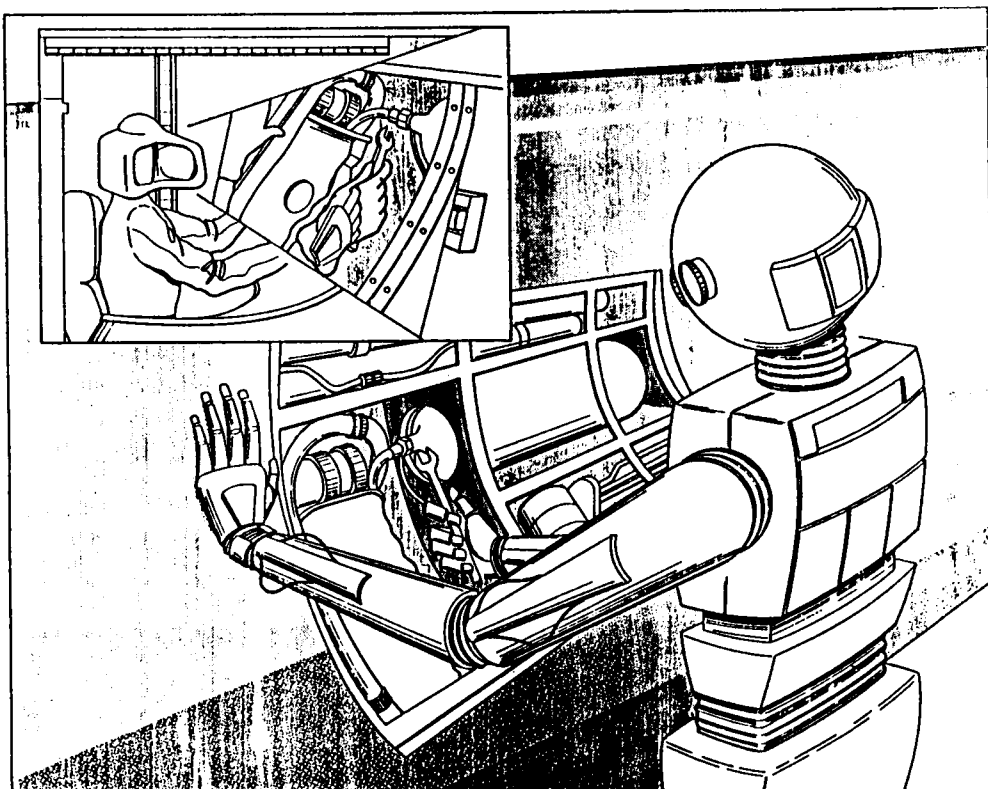
TELEPRESENCE/ADAPTIVE ROBOTICS

DESCRIPTION

RELATIVELY UNSOPHISTICATED ROBOTS THAT PERMIT MAN TO
VIEW AND MANIPULATE OBJECTS FROM REMOTE LOCATIONS

PAYOFFS

- RUNWAY AND AIRCRAFT REPAIR AND REFURBISHMENT
IN CBR ENVIRONMENT
- REMOTE SITE MANNING
- SCALE UP FOR HEAVY LIFT AND CONSTRUCTION, ETC
- SCALE DOWN FOR ELECTRONIC DEVICE REPAIR, ETC



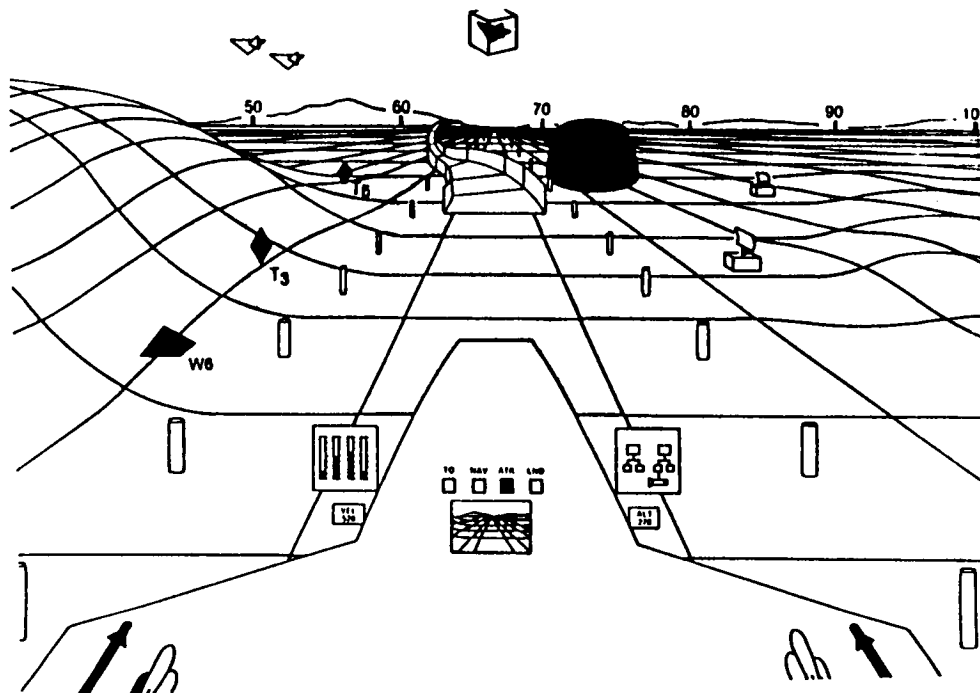
SUPER COCKPIT

DESCRIPTION

FULL INTEGRATION OF 3-D NATURAL DISPLAY OF
SENSORS, FLIGHT CONTROL, AND FIRE-CONTROL SYSTEMS

PAYOFFS

- o ALL-WEATHER/NIGHT OPS
- o ALL AXES SITUATIONAL AWARENESS
 - oo INCREASED SURVIVABILITY AND KILL EFFECTIVENESS
- o REDUCED PILOT WORKLOAD



INTEGRATED PHOTONICS

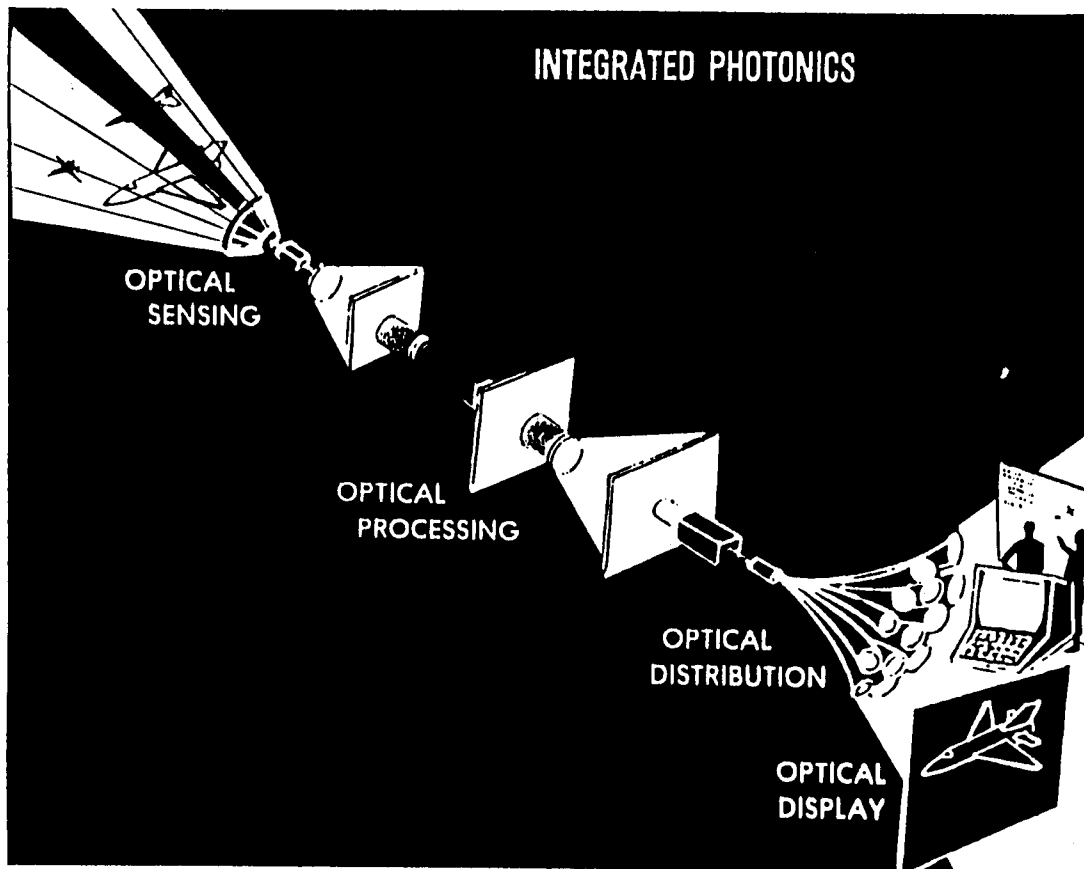
DESCRIPTION

INTEGRATE OPTICAL SYSTEMS DEVICES TO ESSENTIALLY REPLACE ELECTRONS WITH PHOTONS IN A VARIETY OF APPLICATIONS

PAYOFFS

- o ALL-PHOTONIC SYSTEMS -- AIRCRAFT, SPACECRAFT, 21ST CENTURY BATTLE MANAGEMENT, ETC
- oo EMP HARDENED/RADIATION HARDENED
- oo EXTREMELY DIFFICULT TO DETECT AND JAM
- o AT LEAST 10,000X INCREASE IN INFORMATION TRANSFER SPEED, 100X IN PROCESSING SPEED

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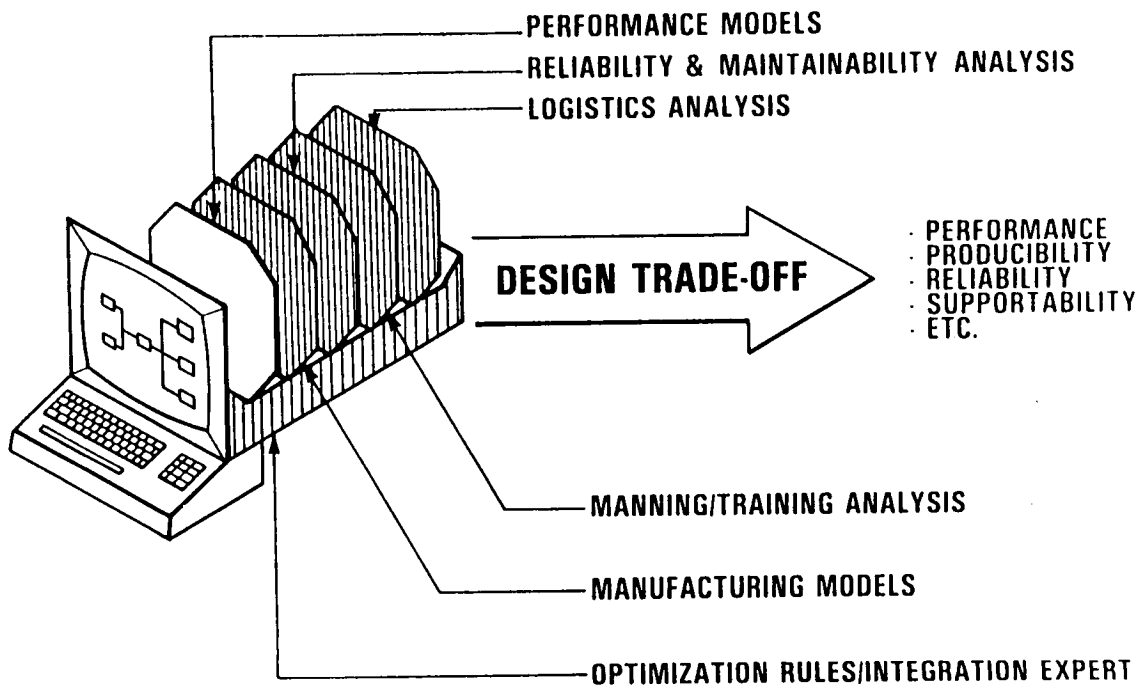
UNIFIED LIFE CYCLE ENGINEERING

DESCRIPTION

EXPANDED & INTEGRATED COMPUTER MODELS OF
PERFORMANCE, MANUFACTURING & SUPPORTABILITY

PAYOFF

TRADEOFFS DURING DESIGN PHASE. BETTER
SYSTEMS THAT ARE PRODUCIBLE, AFFORDABLE
& SUPPORTABLE



IMPLEMENTATION PLAN

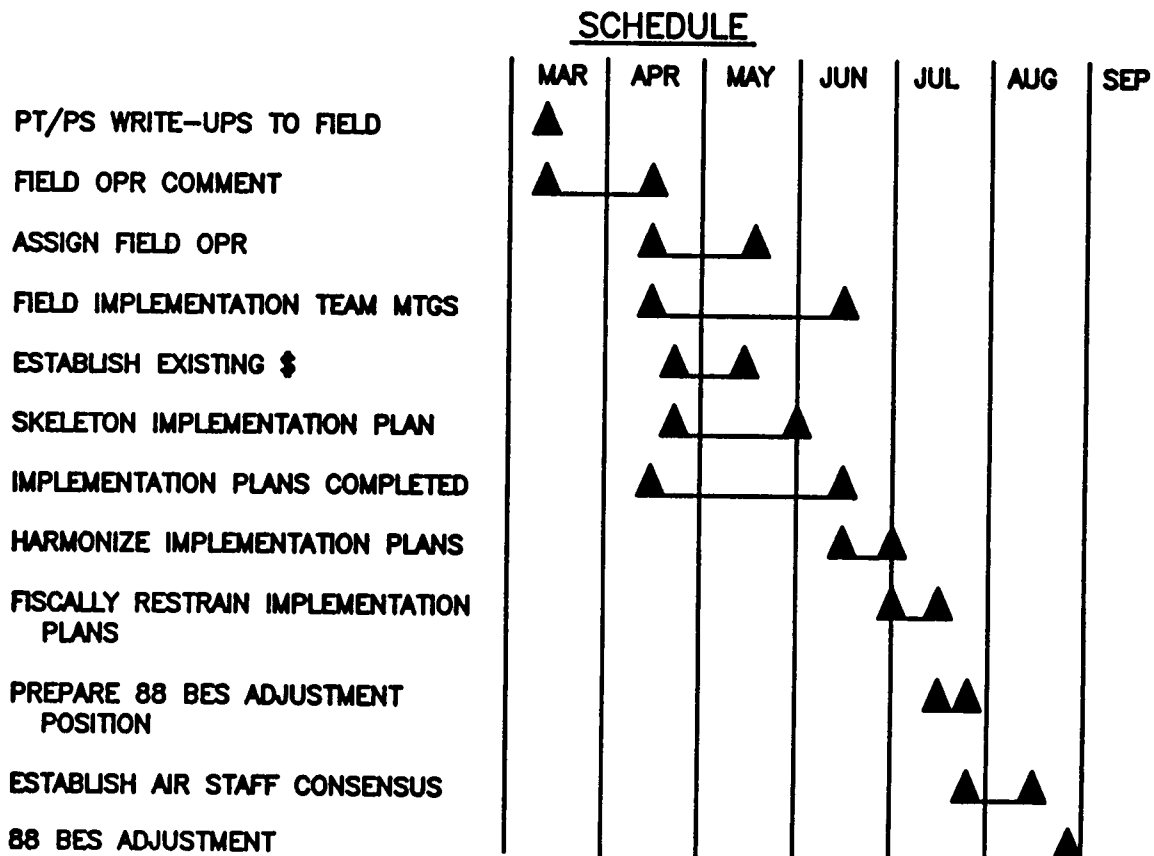
IMPLEMENTATION OBJECTIVES

APPROVED INVESTMENT STRATEGY FOR FORECAST II INITIATIVES
ADVOCATED BY THE MAJCOMS AND AIR STAFF
"HARMONIZED" WITH OTHER SERVICES, DOD, & AGENCIES

LEVERAGING OF INDUSTRY AND ACADEMIA
FOCUSING OF IR&D
GRANT RESEARCH

PUBLIC AWARENESS AND SUPPORT
TRADE PUBLICATIONS
GENERAL MEDIA SOURCES

PROJECT PLANS



SUMMARY

FORECAST II HAS ACCOMPLISHED ITS OBJECTIVES
OF IDENTIFYING HIGH LEVERAGE TECHNOLOGIES
FOR CORPORATE AF REVIEW

IMPLEMENTATION IS UNDERWAY WITH EMPHASIS ON
RESTRUCTURING EXISTING PROGRAMS AND
PROGRAMMING RESOURCES IN THE FY88 BES/FY89 POM

MANY JOINT SERVICE/AGENCY OPPORTUNITIES
EXIST